

REMARKS

We have carefully considered the Office Action dated December 22, 2003 in which claims 1, 2, 4, 5, 8-10, 12, 13, 16-18, 20, 21 and 22-44 are rejected as anticipated by United States Patent 6,389,016 to Sabaa et al. and the remaining claims are rejected as obvious over the Sabaa patent alone or in combination with United States Patent 6,006,268 Coile.

The invention is a system or a method that allows a sending station to segment data and transmit the data segments in the form of packets, without requiring the station to maintain, as overhead, pointers or data offset information. The inventive system includes in a packet header field information that, after conventional processing by a receiver, points to or identifies the segment of data to be sent in a next packet. The processed information, which is returned to the sender in a packet header field of an acknowledgement packet, is used by the sender **expressly** to point to or otherwise identify the next data segment for transmission, and thus, replace the data offsets and/or pointers that are conventionally required to be maintained by the sending station.

More specifically, the system interprets a data packet field, e.g., the sequence number field, as if the field is segmented into a number of subfields. The system then includes in at least one of the subfields a value that, after processing at a receiving station and being returned as a portion of a corresponding acknowledgement sequence number, identifies the segment of data to be transmitted in a next data packet. Further, the remaining subfields of the header field are generated to comply with the rules of the

applicable transmission protocol, such that the contents of the field can be manipulated in a conventional manner by the receiving station to convey other necessary protocol information to the sender.

When the sending station receives the corresponding acknowledgement sequence number, the sending station uses the portion of that number that corresponds to the applicable subfield to identify the data segment to be included in the next data packet. The sending station also uses the other information in the acknowledgement sequence number field in a conventional manner, and produces a next data packet to transmit the identified data segment. Thus, the sending station need not separately maintain a conventional pointer or offset value as part of, for example, a transmission control block. Accordingly, the sending station uses less memory for the transmitting operations.

As described in one embodiment in the application, the sequence number field of the data packet is interpreted as being partitioned into three subfields - with the subfield that includes the least significant bits consisting of n bits, where the data segments are 2^n bits long. For a first or 0th data segment, for example, the middle subfield is given a value of all zeros.

When the receiving station receives the packet, the receiving station manipulates the sequence number in a conventional manner and produces an acknowledgement sequence number for that particular data packet. Following the conventional TCP rules, the receiving station produces the acknowledgement sequence number by incrementing the sequence number by the length of the received data segment, or by a value of 2^n . The result is that the value of the middle subfield, which starts at the $n+1^{\text{st}}$ bit, is incremented

by one. The receiving station then transmits the acknowledgement sequence number back to the transmitting station as part of an acknowledgement packet in a conventional manner.

The transmitting station interprets the bits of the acknowledgement sequence number that correspond to the middle subfield as an offset value, which indicates that the next 2^n -bit data segment i.e., the 1st segment, should be sent in a next data packet. Further the transmitting station interprets the remaining portions of the acknowledgement sequence in a conventional manner, that is, as conveying conventional TCP information. The transmitter station then includes the indicated data segment in the next data packet, along with an appropriately updated sequence number, and transmits the data packet to the receiving station. The operations continue in this manner until all of the segments of the data are transmitted to the receiving station by the transmitting station.

The Sabaa system operates in an entirely different manner, using a minimum number of acknowledgements. The Sabaa system uses a single positive acknowledgement if all of the packets associated with the segmented data are received in order at the receiving station. (See, col. 5, lines 47-50; col. 5, lines 58-63). Accordingly, the Sabaa system does not provide, through corresponding acknowledgements, information that points to or identifies the data segments that are to be included in the respective data packets.

If the receiving station in the Sabaa system receives an out of sequence packet, the receiving station generates a single negative acknowledgement, to inform the transmitting station that a particular packet has been lost. In response, the transmitting

station begins retransmitting the data packets starting with the lost data packet. (col. 7, lines 9-21). Accordingly, the Sabaa system does not provide, through corresponding acknowledgements, information that points to or identifies the data segments that are to be included in the respective data packets.

The Sabaa patent thus does not anticipate, teach or suggest the current invention as set forth in independent claims 1 and 9, 17, 25, 26, 29, 32, 35, 37, 39, 41 and the claims that depend therefrom because, *inter alia*, the Sabaa system does not anticipate, teach or suggest a system in which the sending station is provided with pointers, offsets or other information that identifies the data segments to be transmitted in respective data packets by the return of associated processed header field values in corresponding acknowledgement packets. Indeed, the Sabaa reference teaches away from the invention by minimizing the number of acknowledgements that are sent from the receiving station to the sending station (see, e.g., col. 5, lines 61-64; col. 10, lines 64 – col. 11, line 1; col. 11, lines 23-26).

The Coile patent describes a system in which a bypass path is provided for a proxy application. The Coile system uses particular synchronization factors to, in essence, associate sequence numbers between the client-to-proxy path and the proxy-to-server path, such that the bypass path through the proxy device appears seamless to the client and the server. The Coile system does not teach or suggest a mechanism by which a sending station is provided with pointers, offsets or other information that identifies the data segments to be transmitted in respective data packets by the return of associated processed header field values in corresponding acknowledgement packets. Indeed, the

Coile system contemplates that the sending station and the server will each maintain conventional transmission control blocks, which contain pointers or offset values for the data. Only the proxy station, which operates essentially as a pass through connection for the data, need not contain the associated transmission overhead. In contrast, the current system provides a mechanism by which the sending stations need not maintain the pointers or offset values as transmission overhead.

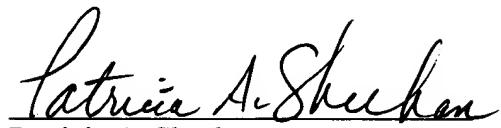
The combination of the Coile system with the Sabaa system adds to the Sabaa system a pass-through proxy mechanism that operates with sequence number synchronization factors. The combination does not teach or suggest the current invention because, *inter alia*, the combination does not teach or suggest a system in which information that points to or otherwise identifies the data segments that are to be included in respective data packets is provided to a sending station through corresponding acknowledgements received from a receiving station.

The claims, as amended, should now be in form for allowance. We respectfully request that the Examiner reconsider the rejections and issue a Notice of Allowance for all pending claims.

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Respectfully submitted,



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